

7-1: Basic Principles of Probability

Warm-up: A drawer contains r red socks, b blue socks, and w white socks. Assume that you draw a sock randomly from the drawer.

1. What is the probability that the sock is red?
2. What is the probability that the sock is not white?
3. What is the probability that the sock is green?

Probability theory:

Experiment:

Outcome:

Sample space:

Example 1: A standard deck of playing cards is used to draw a card at random.

- a. Give the sample space and describe some of the characteristics of the deck.
- b. Identify the event “red face cards.”

Event:

Probability that E occurs:

Fair:

Biased:

Example 2: Suppose two fair dice are rolled. What sum has the highest probability of occurring? What is its probability?

Example 3: Persons A, B, and C were playing a game and needed to decide who would go first. Person A suggested tossing two dice. If a 3, 6, 9, or 12 appeared, person A would go first. If a 2, 5, 8, or 11 appeared, person B would go first. If a 1, 4, 7, or 10 appeared, person C would go first. Is this fair? Why or why not?

Theorem: Basic Properties of Probability

Example 4: If births of boys and girls are assumed equally likely, what is the probability that a family with four children has all girls?

Homework:

When you make a mistake, there are only three things you should ever do about it: admit it, learn from it, and don't repeat it. - Paul "Bear" Bryant